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AGRICULTURAL MEMORANDUM NO 931

Tables of estimated average accumulated degree days above and below various bases for the agroclimatic areas 17W, 17E, 22W, 22E, 23, 24, 28, 29, 33W and 33E.

By S D Cook

Introduction

Degree days are used in agricultural meteorology for a variety of purposes including:- estimates of glasshouse heating requirements, development of crops, assessing the suitability of crops to particular locations, etc.

We have various enquiries from time to time from advisors for monthly degree days above or below a particular base.

Because of this it was decided to prepare comprehensive tables of estimated average monthly values for the agroclimatic areas covering much of East Anglia and Lincolnshire.

Method

Thom's method (1) for estimating average monthly degree day figures was used in the calculation. Monthly mean temperatures for the agroclimatic regions for the period 1941-70 were obtained from Technical Bulletin 35 (2) and the standard deviation of monthly mean temperatures was estimated from maps in Professional Notes No 125 (3). A program had previously been written and recorded on cassette which calculated the estimated average monthly total of degree days above or below any base using the following inputs.

(i) Monthly mean temperature
(ii) Standard deviation of monthly mean temperature
(iii) Days in the month
(iv) Base temperature

Results

Estimated average monthly degree days were calculated in this way for agroclimatic areas 17W, 17E, 22W, 22E, 23, 24, 28, 29, 33W and 33E. (Figure 1). Values above bases 0°C to 22°C and below bases 0°C to 26°C in two degree increments, together with yearly totals, are shown in tables 1 to 10.

Discussion

The tables are of particular use in comparing monthly values for one area with another and also for comparing the degree days above a particular base during the growing season.

It must be noted however, that these are only estimates for the areas and that individual sites within the area can vary considerably depending on height, aspect, proximity to the coast, soil type etc. and the user should bear this in mind.

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Acknowledgement

The program used to calculate the estimated average accumulated degree days was written for our Wang calculator by Mr L D J Harvey now of Met 08a Bracknell.

References

1. Thom, H C S; Normal degree days below any base. Mon. Weath. Rev. Washington DC 82, 1954, p 111.

2. Smith L P; The agricultural climate of England and Wales. Technical Bulletin 35, MAFF 1976.

3. Shellard H C; Averages of accumulated temperature and standard deviation of monthly mean temperature over Britain, 1921-50. Professional Notes No. 125, 1959. (Meteorological Office, London)

Any comments or suggestions on this paper should be sent to the author.

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FIGURE 1 AGROCLIMATIC AREAS FOR WHICH DEGREE DAY TABLES HAVE BEEN PRODUCED

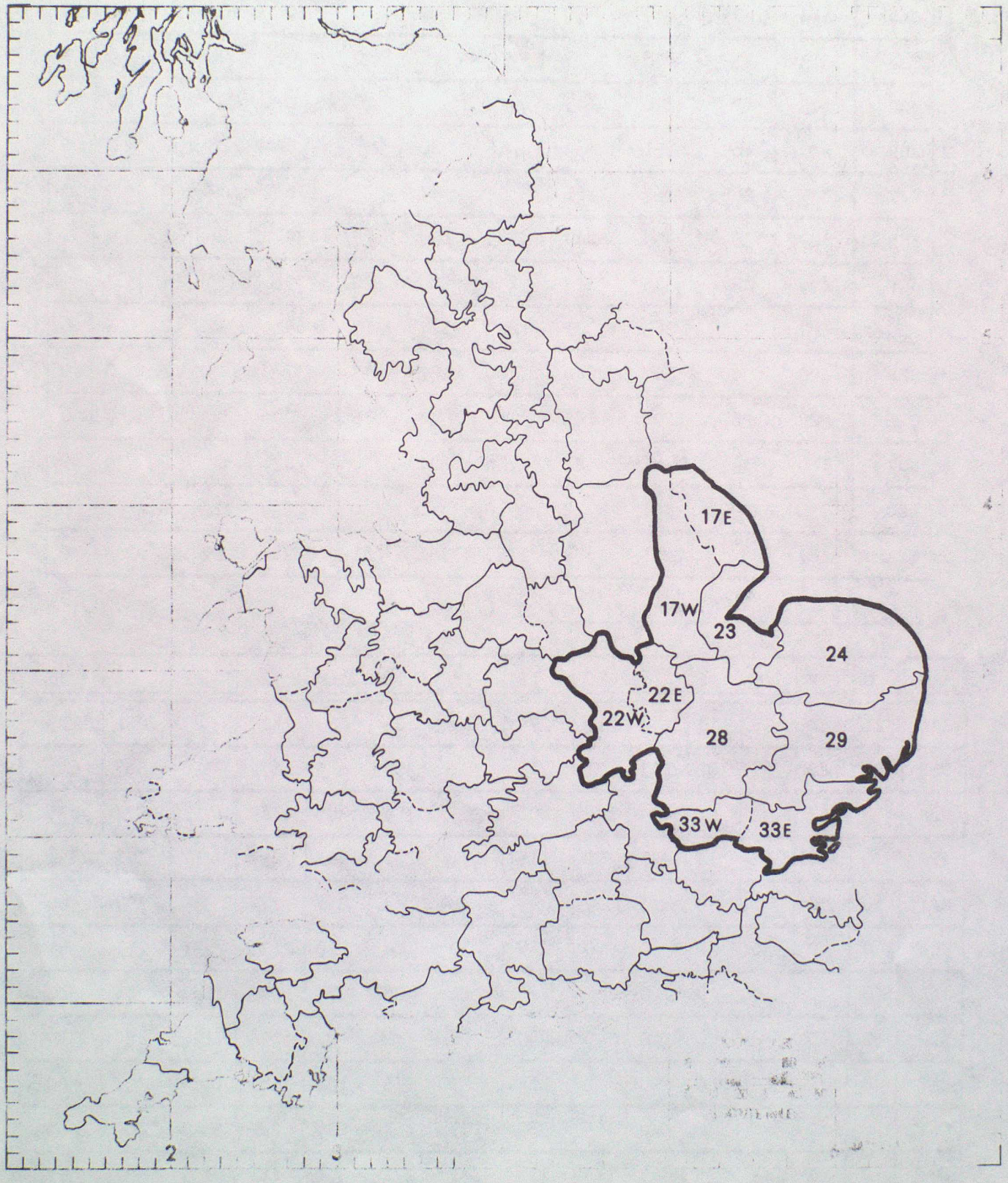

TABLE 1
AGROCLIMATIC AREA 17W AVERAGE HEIGHT (42M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	114	75	44	21	7	0	0	0	0	0	0	0
FEB	113	77	48	25	10	2	0	0	0	0	0	0
MAR	173	121	78	45	21	6	0	0	0	0	0	0
APR	249	189	131	83	46	20	5	0	0	0	0	0
MAY	347	285	223	161	103	57	24	6	0	0	0	0
JUN	429	369	309	249	189	129	77	39	13	1	0	0
JUL	499	437	375	313	251	189	129	79	41	15	2	0
AUG	487	425	363	301	239	177	117	69	33	10	1	0
SEP	420	360	300	240	180	122	73	37	14	2	0	0
OCT	329	267	205	143	86	44	16	2	0	0	0	0
NOV	189	131	81	44	18	4	0	0	0	0	0	0
DEC	135	90	54	27	10	1	0	0	0	0	0	0
YEAR	3484	2826	2211	1652	1160	751	441	232	101	28	3	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	21	44	75	114	162	217	279	341	403	465	527	589	651	713
FEB	20	40	67	102	143	191	246	302	359	415	472	528	585	641
MAR	2	12	32	61	99	146	201	263	325	387	449	511	574	635
APR	0	0	2	14	37	71	115	171	231	291	351	411	471	531
MAY	0	0	0	0	3	19	49	92	149	211	273	335	397	459
JUN	0	0	0	0	0	0	8	30	64	112	171	231	291	351
JUL	0	0	0	0	0	0	0	14	38	74	123	183	245	307
AUG	0	0	0	0	0	0	0	16	42	82	134	195	257	319
SEP	0	0	0	0	0	2	14	37	73	122	180	240	300	360
OCT	0	0	0	0	6	25	59	107	167	229	289	349	409	469
NOV	0	1	12	35	69	115	171	231	291	351	411	471	531	591
DEC	8	25	51	86	131	184	245	307	369	431	493	555	617	679
YEAR	51	122	239	412	650	970	1387	1911	2511	3170	3873	4598	5328	6055

TABLE 2

AGROCLIMATIC AREA 17E **AVERAGE HEIGHT** (47M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	112	71	39	17	4	0	0	0	0	0	0	0
FEB	113	75	46	23	9	1	0	0	0	0	0	0
MAR	169	117	75	42	19	5	0	0	0	0	0	0
APR	243	183	124	74	37	13	1	0	0	0	0	0
MAY	335	273	211	149	90	45	16	2	0	0	0	0
JUN	420	360	300	240	180	120	69	32	9	0	0	0
JUL	487	425	363	301	239	177	115	61	24	4	0	0
AUG	481	419	357	295	233	171	109	58	23	4	0	0
SEP	417	357	297	237	177	119	71	36	13	1	0	0
OCT	329	267	205	143	86	47	18	3	0	0	0	0
NOV	192	132	78	38	13	1	0	0	0	0	0	0
DEC	132	85	49	22	6	0	0	0	0	0	0	0
YEAR	3430	2764	2144	1581	1093	699	399	192	69	9	0	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	16	37	67	107	156	214	276	338	400	462	524	586	648	710
FEB	17	36	63	97	139	188	243	299	356	412	469	525	582	638
MAR	2	12	31	60	99	147	205	267	329	391	453	515	577	639
APR	0	0	0	11	34	70	118	177	237	297	357	417	477	537
MAY	0	0	0	0	0	21	53	101	161	223	285	347	409	471
JUN	0	0	0	0	0	0	9	32	69	120	180	240	300	360
JUL	0	0	0	0	0	0	0	8	33	75	133	195	257	319
AUG	0	0	0	0	0	0	0	11	38	81	139	201	263	325
SEP	0	0	0	0	0	2	15	39	76	124	183	243	303	363
OCT	0	0	0	0	6	25	59	107	167	229	291	353	415	477
NOV	0	0	6	26	61	109	168	228	288	348	408	468	528	588
DEC	5	20	45	81	127	183	245	307	369	431	493	555	617	679
YEAR	40	105	212	382	622	959	1391	1914	2523	3193	3915	4645	5376	6106

TABLE 3
AGROCLIMATIC AREA 22W AVERAGE HEIGHT (117M)
DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	114	77	48	26	11	2	0	0	0	0	0	0
FEB	117	82	53	31	15	5	0	0	0	0	0	0
MAR	166	113	71	39	16	3	0	0	0	0	0	0
APR	243	183	126	79	43	18	4	0	0	0	0	0
MAY	347	285	223	161	104	58	26	7	0	0	0	0
JUN	423	363	303	243	183	123	73	35	11	1	0	0
JUL	496	434	372	310	248	186	127	78	41	16	3	0
AUG	487	425	363	301	239	177	119	72	37	13	2	0
SEP	411	351	291	231	171	115	69	35	12	1	0	0
OCT	310	248	186	125	73	36	11	1	0	0	0	0
NOV	177	121	76	41	17	4	0	0	0	0	0	0
DEC	125	84	51	26	10	1	0	0	0	0	0	0
YEAR	3416	2766	2163	1613	1130	728	429	228	101	31	5	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	29	52	82	120	164	215	273	335	397	459	521	583	645	707
FEB	28	49	77	111	151	197	249	305	362	418	475	531	588	644
MAR	3	15	37	69	111	163	223	285	347	409	471	533	595	657
APR	0	0	0	16	40	75	121	177	237	297	357	417	477	537
MAY	0	0	0	0	2	14	39	77	128	189	251	313	375	437
JUN	0	0	0	0	0	0	3	18	47	89	144	204	264	324
JUL	0	0	0	0	0	0	0	9	30	62	106	161	223	285
AUG	0	0	0	0	0	0	0	12	34	68	113	171	233	295
SEP	0	0	0	0	0	0	9	28	59	102	156	216	276	336
OCT	0	0	0	0	3	19	49	92	149	211	273	335	397	459
NOV	0	1	9	28	57	97	148	207	267	327	387	447	507	567
DEC	10	26	51	84	125	175	233	295	357	419	481	543	605	667
YEAR	70	143	256	428	653	955	1347	1840	2414	3050	3735	4454	5185	5915

TABLE 4
AGROCLIMATIC AREA 22E AVERAGE HEIGHT (81M)
DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	114	77	47	25	10	2	0	0	0	0	0	0
FEB	115	60	52	29	13	4	0	0	0	0	0	0
MAR	169	117	75	42	19	5	0	0	0	0	0	0
APR	246	186	128	81	44	19	4	0	0	0	0	0
MAY	350	288	226	164	106	60	27	7	0	0	0	0
JUN	426	366	306	246	186	126	74	35	11	1	0	0
JUL	502	440	378	316	254	192	132	81	43	17	3	0
AUG	490	428	366	304	242	180	121	72	36	13	1	0
SEP	420	360	300	240	180	122	75	39	15	2	0	0
OCT	319	257	195	133	80	40	14	2	0	0	0	0
NOV	186	128	79	42	17	3	0	0	0	0	0	0
DEC	130	87	54	28	11	2	0	0	0	0	0	0
YEAR	3467	2794	2206	1650	1162	755	447	236	105	33	4	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	33	59	91	131	177	231	295	359	423	487	551	615	679	743
FEB	27	49	77	111	152	199	251	308	364	421	477	534	590	647
MAR	2	12	31	60	99	147	205	267	329	391	453	515	577	639
APR	0	0	3	15	38	73	118	174	234	294	354	414	474	534
MAY	0	0	0	0	4	20	49	91	146	208	270	332	394	456
JUN	0	0	0	0	0	0	8	29	65	115	174	234	294	354
JUL	0	0	0	0	0	0	0	13	36	72	121	180	242	304
AUG	0	0	0	0	0	0	0	17	43	81	132	192	254	316
SEP	0	0	0	0	0	2	15	39	75	122	180	240	300	360
OCT	0	0	0	0	9	31	67	116	177	239	301	363	425	487
NOV	0	2	13	36	71	117	174	234	294	354	414	474	534	594
DEC	15	35	63	99	144	197	257	319	381	443	505	567	629	691
YEAR	77	157	278	352	694	1017	1439	1966	2567	3227	3932	4660	5392	,6125

TABLE 5

AGROCLIMATIC AREA 23 AVERAGE HEIGHT (5M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	118	78	47	24	8	1	0	0	0	0	0	0
FEB	115	79	49	26	11	2	0	0	0	0	0	0
MAR	175	122	79	45	20	6	0	0	0	0	0	0
APR	255	195	137	87	49	22	5	0	0	0	0	0
MAY	450	288	226	164	105	59	26	6	0	0	0	0
JUN	432	372	312	252	192	132	78	38	13	1	0	0
JUL	499	437	375	313	251	189	128	76	37	12	1	0
AUG	496	434	372	310	248	186	125	75	37	13	1	0
SEP	426	366	306	246	186	128	79	42	17	3	0	0
OCT	335	273	211	149	91	47	18	3	0	0	0	0
NOV	192	132	81	42	16	2	0	0	0	0	0	0
DEC	139	94	58	30	12	2	0	0	0	0	0	0
YEAR	3632	2870	2253	1688	1189	776	459	240	104	29	2	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	22	44	75	113	160	215	276	338	400	462	524	586	648	710
FEB	19	39	66	100	141	189	243	299	356	412	469	525	582	638
MAR	1	10	29	57	95	142	198	260	322	384	446	508	570	632
APR	0	0	2	12	34	67	111	165	225	285	345	405	465	525
MAY	0	0	0	0	3	18	47	90	146	208	270	332	394	456
JUN	0	0	0	0	0	0	6	26	61	109	168	228	288	348
JUL	0	0	0	0	0	0	0	11	34	71	122	183	245	307
AUG	0	0	0	0	0	0	0	13	37	75	125	186	248	310
SEP	0	0	0	0	0	0	13	36	71	117	174	234	294	354
OCT	0	0	0	0	4	23	55	102	161	223	285	347	409	471
NOV	0	0	9	30	64	110	168	228	288	348	408	468	528	588
DEC	9	26	51	86	129	182	242	304	366	428	490	552	614	676
YEAR	51	119	232	398	630	946	1359	1872	2467	3122	3826	4554	5285	6015

TABLE 6

AGROCLIMATIC AREA 24 ~~AVERAGE HEIGHT~~ (33M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	113	75	44	22	7	0	0	0	0	0	0	0
FEB	111	74	44	22	8	1	0	0	0	0	0	0
MAR	169	116	73	40	17	4	0	0	0	0	0	0
APR	252	192	133	84	45	19	4	0	0	0	0	0
MAY	347	285	223	161	101	53	21	3	0	0	0	0
JUN	432	372	312	252	192	132	75	33	8	0	0	0
JUL	499	437	375	313	251	189	127	70	30	7	0	0
AUG	496	434	372	310	248	186	124	72	34	10	0	0
SEP	432	372	312	252	192	132	81	42	16	2	0	0
OCT	341	279	217	155	96	51	20	3	0	0	0	0
NOV	198	138	85	45	18	3	0	0	0	0	0	0
DEC	141	94	57	29	11	2	0	0	0	0	0	0
YEAR	3531	2868	2257	1685	1186	772	452	223	88	19	0	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	24	47	78	118	165	220	282	344	406	468	530	592	654	716
FEB	15	34	61	95	138	187	243	299	356	412	469	525	582	638
MAR	0	11	29	59	97	146	205	267	329	391	453	515	577	639
APR	0	0	1	12	33	67	112	168	228	288	348	408	468	528
MAY	0	0	0	0	2	16	45	90	149	211	273	335	397	459
JUN	0	0	0	0	0	0	3	21	56	108	168	228	288	348
JUL	0	0	0	0	0	0	0	5	27	65	121	183	245	307
AUG	0	0	0	0	0	0	0	10	34	72	124	186	248	310
SEP	0	0	0	0	0	0	9	30	64	110	174	228	288	348
OCT	0	0	0	0	3	20	51	96	155	217	279	341	403	465
NOV	0	0	7	27	60	105	162	222	282	342	415	462	522	582
DEC	7	23	48	82	116	178	239	301	363	425	487	549	611	673
YEAR	46	115	224	393	614	939	1351	1838	2449	3109	3841	4552	5283	6013

TABLE 7

AGROCLIMATIC AREA 28 AVERAGE HEIGHT (56M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	124	86	55	31	14	4	0	0	0	0	0	0
FEB	121	85	55	32	15	5	0	0	0	0	0	0
MAR	177	123	79	44	20	5	0	0	0	0	0	0
APR	252	192	134	85	47	21	5	0	0	0	0	0
MAY	357	295	233	171	111	64	30	9	0	0	0	0
JUN	438	378	318	258	198	138	82	40	13	1	0	0
JUL	511	449	387	325	263	201	139	86	46	18	3	0
AUG	499	437	375	313	251	189	129	79	41	15	2	0
SEP	426	366	306	246	186	128	81	44	19	4	0	0
OCT	332	270	208	146	90	47	18	3	0	0	0	0
NOV	192	133	84	45	19	4	0	0	0	0	0	0
DEC	137	93	58	31	13	3	0	0	0	0	0	0
YEAR	3566	2907	2292	1727	1227	809	484	261	119	38	5	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	31	55	86	124	169	221	279	341	403	465	527	589	651	713
FEB	25	45	72	106	145	191	243	299	356	412	469	525	582	638
MAR	0	9	26	55	91	138	195	257	319	381	443	505	567	629
APR	0	0	2	13	35	69	113	168	228	288	348	408	468	528
MAY	0	0	0	0	2	16	42	82	134	195	257	319	381	443
JUN	0	0	0	0	0	0	4	22	55	103	162	222	282	342
JUL	0	0	0	0	0	0	0	9	30	64	111	171	233	295
AUG	0	0	0	0	0	0	0	14	38	74	123	183	245	307
SEP	0	0	0	0	0	3	15	38	73	118	174	236	298	360
OCT	0	0	0	0	6	26	59	105	164	226	288	350	412	474
NOV	0	1	12	33	67	112	168	228	288	348	408	468	528	588
DEC	13	31	58	93	137	189	248	310	372	434	496	558	620	682
YEAR	69	141	256	424	652	965	1366	1873	2460	3108	3806	4534	5267	5999

TABLE 8

AGROCLIMATIC AREA 29 AVERAGE HEIGHT (49M)

DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	115	77	46	23	8	1	0	0	0	0	0	0
FEB	117	82	53	30	14	4	0	0	0	0	0	0
MAR	171	117	73	39	16	3	0	0	0	0	0	0
APR	255	195	136	86	47	20	5	0	0	0	0	0
MAY	357	295	233	171	109	59	25	5	0	0	0	0
JUN	438	378	318	258	198	138	83	42	15	2	0	0
JUL	515	453	391	329	267	205	143	85	42	14	1	0
AUG	502	440	378	316	254	192	130	77	37	12	1	0
SEP	432	372	312	252	192	134	85	47	21	5	0	0
OCT	341	279	217	155	99	55	24	6	0	0	0	0
NOV	198	139	88	49	21	5	0	0	0	0	0	0
DEC	135	90	54	27	10	1	0	0	0	0	0	0
YEAR	3576	2917	2299	1735	1235	817	495	262	115	33	2	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	25	49	80	119	166	221	282	344	406	468	530	592	654	716
FEB	24	45	72	106	146	193	246	302	359	415	472	528	585	641
MAR	0	9	27	55	94	143	201	263	325	387	449	511	573	635
APR	0	0	1	11	32	65	109	165	225	285	374	405	465	525
MAY	0	0	0	0	1	13	40	83	139	201	263	325	387	449
JUN	0	0	0	0	0	0	5	24	57	103	162	222	282	342
JUL	0	0	0	0	0	0	0	4	23	57	107	167	229	291
AUG	0	0	0	0	0	0	0	8	31	67	119	180	242	304
SEP	0	0	0	0	0	2	13	35	69	113	168	228	288	348
OCT	0	0	0	0	6	24	55	99	155	217	279	341	390	465
NOV	0	1	10	31	63	107	162	222	282	342	402	462	522	582
DEC	8	25	51	86	131	184	245	307	369	431	493	555	617	679
YEAR	57	129	241	408	639	950	1358	1856	2440	3086	3818	4516	5234	5977

TABLE 9.

AGROCLIMATIC AREA 33W AVERAGE HEIGHT (97M)
DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	124	86	54	30	13	3	0	0	0	0	0	0
FEB	121	85	55	32	15	5	0	0	0	0	0	0
MAR	171	117	73	39	16	3	0	0	0	0	0	0
APR	255	195	137	87	49	22	5	0	0	0	0	0
MAY	360	298	236	174	113	65	30	8	0	0	0	0
JUN	444	384	324	264	204	144	88	45	17	2	0	0
JUL	515	453	391	329	267	205	143	90	49	21	5	0
AUG	502	440	378	316	254	192	132	81	43	17	3	0
SEP	432	372	312	252	192	135	87	49	22	6	0	0
OCT	338	276	214	152	95	51	21	4	0	0	0	0
NOV	195	137	87	49	22	5	0	0	0	0	0	0
DEC	140	96	59	32	13	3	0	0	0	0	0	0
YEAR	3597	2939	2320	1756	1253	833	506	277	131	46	8	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	28	52	82	120	165	217	276	338	400	462	524	586	648	710
FEB	25	45	72	106	145	191	243	299	356	412	469	525	582	638
MAR	0	9	27	55	94	143	201	263	325	387	449	511	573	635
APR	0	0	2	12	34	67	111	165	225	285	345	405	465	525
MAY	0	0	0	0	2	15	42	83	136	198	260	322	384	446
JUN	0	0	0	0	0	0	4	21	53	98	156	216	276	336
JUL	0	0	0	0	0	0	0	9	31	64	110	167	229	291
AUG	0	0	0	0	0	0	0	13	36	72	121	180	242	304
SEP	0	0	0	0	0	3	15	37	70	114	168	228	288	348
OCT	0	0	0	0	5	23	55	100	158	220	282	344	406	468
NOV	0	2	12	34	67	111	165	225	285	345	405	465	525	585
DEC	10	27	53	88	131	182	242	304	366	428	490	552	614	676
YEAR	63	135	248	415	643	952	1354	1857	2441	3085	3779	4501	5232	5962

TABLE 10
AGROCLIMATIC AREA 33E AVERAGE HEIGHT (40M)
DEGREE DAYS ABOVE GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22
JAN	126	85	53	28	11	2	0	0	0	0	0	0
FEB	125	88	58	34	16	5	0	0	0	0	0	0
MAR	180	124	79	44	19	5	0	0	0	0	0	0
APR	261	201	142	92	52	24	7	0	0	0	0	0
MAY	366	304	242	180	119	67	31	8	0	0	0	0
JUN	450	390	330	270	210	150	93	49	19	3	0	0
JUL	524	462	400	338	276	214	152	94	49	19	3	0
AUG	511	449	387	325	263	201	139	85	44	16	2	0
SEP	441	381	321	261	201	142	92	52	24	7	0	0
OCT	347	285	223	161	104	58	26	7	0	0	0	0
NOV	207	147	95	54	25	7	0	0	0	0	0	0
DEC	146	99	61	32	12	2	0	0	0	0	0	0
YEAR	3684	3015	2391	1819	1308	877	540	295	136	45	5	0

DEGREE DAYS BELOW GIVEN BASE (°C)

	0	2	4	6	8	10	12	14	16	18	20	22	24	26
JAN	21	42	72	109	154	207	267	329	391	453	515	577	639	701
FEB	21	40	66	99	138	183	234	291	347	404	460	517	573	630
MAR	0	7	23	50	87	135	192	254	316	378	440	502	564	626
APR	0	0	1	11	31	63	106	159	219	279	339	399	459	519
MAY	0	0	0	0	1	12	37	77	130	192	254	316	378	440
JUN	0	0	0	0	0	0	3	19	49	93	150	210	270	330
JUL	0	0	0	0	0	0	0	4	21	53	99	158	220	282
AUG	0	0	0	0	0	0	0	7	28	63	111	171	233	295
SEP	0	0	0	0	0	1	11	31	63	106	159	219	279	339
OCT	0	0	0	0	5	21	51	94	149	211	273	335	397	459
NOV	0	0	8	27	57	100	153	213	273	333	393	453	513	573
DEC	6	21	45	78	121	173	233	295	357	419	481	543	605	667
YEAR	48	110	215	374	594	895	1287	1773	2343	2984	3674	4400	5130	5861